

Cost of Panama Canal and Where the Money Goes

FOUR hundred million dollars! Culebra, Canal Zone, Panama. That is what the Panama Canal will have cost when completed. You need not question the figures. They are dead right and I will give you the items farther on.

But stop first and think what \$4,000,000,000 means. Suppose you had to earn it and your wages were \$2 a day. How long would it take? It would take 200,000,000 days, or more than 800,000 years. The history of man goes back only 6,000 years, and you would have had to work one hundred times the life of this world as far as history is concerned to have done this job.

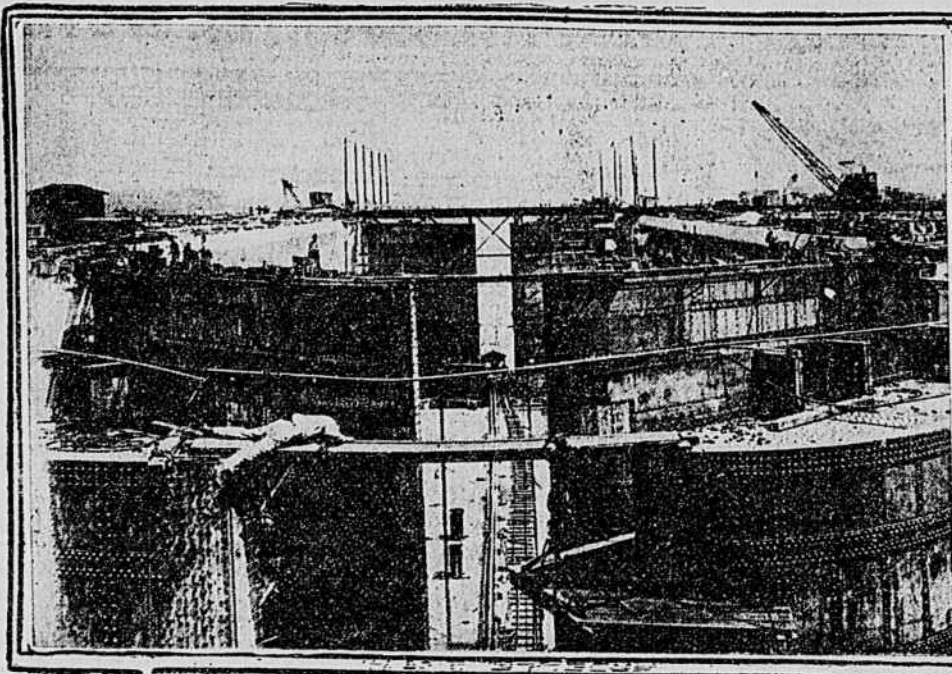
Four hundred million dollars! Suppose it were all in silver coins, such as are now paid to the men who are doing the digging. What a pile and what a weight! One thousand such dollars equal fifty-five pounds, and the whole sum would weigh in round numbers twenty-two million pounds, or eleven thousand tons. At a ton to the wagon it would be enough to load a train of two-horse teams, making a single file over sixty miles of roadway, and the noses of each team might rest on the tailboard of the wagon in front of it.

Indeed, it is a goodly sum. Where has it gone? And is Uncle Sam getting the worth of his money? These are some of the matters I have been looking into this week. I have gone over the canal work and hunted for leaks, and have also made notes of some places where Uncle Sam is using the principle of scientific management and modern economy. I had a look at the books in the administration building here at Culebra, and with the clerks have gone over the ledgers to learn how Uncle Sam costs the cost and to show you what has already been spent and what we must spend in the future. Our Four-Hundred-Million-Dollar Ditch.

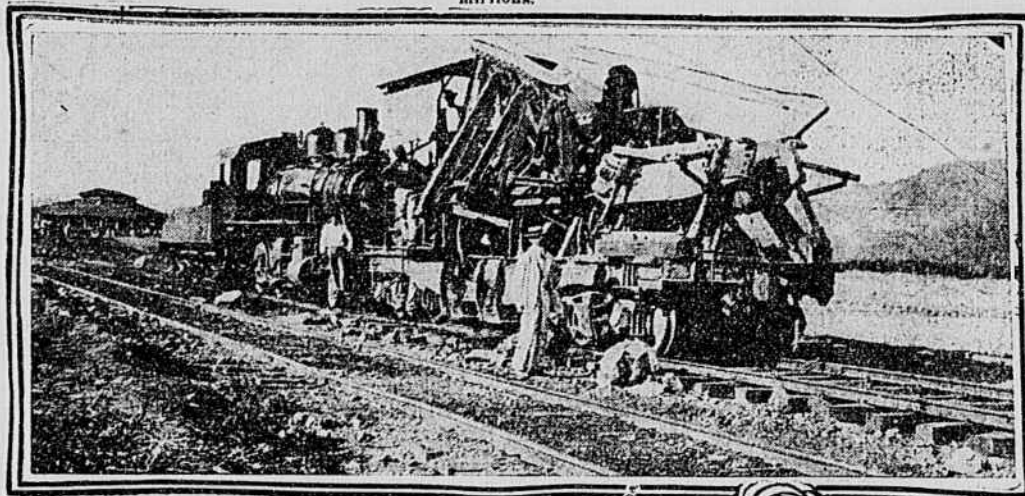
But first let me satisfy you as to the total. President Taft and Colonel Goethals have estimated the cost of the canal at \$375,000,000. In one way they are right, but there are other items which will amount to at least \$25,000,000 more. These are the extra charges entailed by the annual sum we pay Panama, and the fortifications. The first estimate of the cost of the latter was \$15,000,000, and Congress has now cut it down to \$12,000,000. We have already spent more than \$2,000,000, and we will run up to \$20,000,000 before we get through. Moreover, we have agreed to pay Panama \$250,000 a year, beginning with nine years after the treaty by which we took the canal. Eight years have already gone, and a year from now we will be spending that quarter of a million, which will be a fixed charge upon the Treasury for all time to come. Two hundred and fifty thousand dollars is the annual interest on more than six million dollars, and so we must capitalize that six millions and add it to the cost of the canal. And so you have the twenty-five millions without going farther, making, as I have said, a total of four hundred million.

Now let us see where the money has gone. We shall first take the work. We spent \$50,000,000 at the start to get control of the canal property. The French company received \$10,000,000 for its rights and the work it had done and Panama got \$10,000,000 for the Canal Zone and other rights. Then we began to clean up the canal. By the 30th of June next we shall have used up the total appropriations so far made by Congress, and they now equal the vast sum of \$235,565,872.75. At the beginning of this year we had already expended more than \$200,000,000 and the remaining \$35,565,872.75 is the cost of the current month's work.

Uncle Sam's Money-Worth. Is the job a cheap one and is Uncle Sam receiving the worth of his money? The job is not cheap, and nevertheless Uncle Sam is getting the worth of his money. He is getting more than any other great company or government has had for similar work. Let me give some comparative figures. When the French started this canal in 1879, it was planned to build it at sea level and at a cost of \$240,000,000. The first company continued its work for ten years, after which time it became bankrupt. In that time it spent \$200,



A look at the gates of Gatun. The lock gate contract was for over five millions.



Machine efficiency. This dump spreader does the work of a thousand men.

600,000 and excavated about 66,000,000 yards of earth and rock, so that the average cost of digging was about \$1 a yard. Uncle Sam, with all his preliminaries in the way of sanitation and getting ready for work, has been on the job less than eight years and at the end of last February he had taken out over 150,000,000 cubic yards of earth and rock. He has been able to use a little less than 20,000,000 yards of the French digging and has now a total excavation all told of a little more than 200,000,000 cubic yards with something like 20,000,000 yet to dig.

The French cost, as I have shown, was \$1 a yard. Uncle Sam's cost was at one time \$1 a yard, but it has been steadily cut until, in the Culebra division where it is almost solid rock and the expense is the greatest, the total average per cubic yard is less than 64 cents, while the dredging cost at the Atlantic end of the canal is less than 25 cents. Does it not seem as though Uncle Sam is getting the worth of his money? The Suez canal cost all told about \$100,000,000 to build, and the original excavation was 80,000,000 cubic yards. The cost was about \$1.25 per yard, or just twice what we are paying now for taking the rock out here at Culebra. This is so notwithstanding Suez was a ditch through a desert without hill or hollow where the sand could be shoveled out on the banks, and where thousands of felahs were furnished by the khedive to do the work at practically nothing a day. The Chicago drainage canal cost a

little over \$25,000,000, and its excavation amounted to over 42,000,000 cubic yards, of which, however, only about twelve millions were rock. At that rate the digging there cost an average of 50 cents per cubic yard, or 20 cents more than that we are now paying at Panama.

Watching the Corners. It is only by watching the corners that Uncle Sam has been able to cut down the cost of the work to these very low figures. You must remember that he pays the best wages on earth, and he houses his men free of charge. Nevertheless, the cost is about as low as it could be on any great work of this kind almost anywhere in the world. The reduction is made by stopping every leak and by using every available bit of material. The French machines were repaired and used. Two million dollars' worth of the French machinery was modernized and put to work, and every bit of French scrap not in use was sold for what it would bring. The French buildings also, together saved us two million dollars, and every old French shack that has been torn down has found a place in other buildings.

Indeed, I have never seen so much care taken in saving the scraps anywhere as right here at Panama. Lumber is used over and over again. The buildings which form a part of the Gatun Lake basin have been torn down by carpenters, and all the material shipped to other stations in the Canal Zone. The windows and doors, and

even the galvanized roofs were preserved.

Right here at Culebra they are now moving the buildings in advance of a great slide, which is expected, taking in the ground where the penitentiary stands.

It will all be bare by the time the slide comes. In doing such work the men save every hinge, nail and every board and stick that can be used for new construction, and then set the Jamaica negroes to cutting the scraps into kindling wood for the employees. Uncle Sam furnishes free fuel to his men, and kindling is quite expensive.

Millions Saved From Old Material. Indeed it is wonderful how much Uncle Sam saves by the sale of old machinery and various kinds of waste material. The moment he gets through at the close of the work there will be some mighty sales of this kind. So far more than \$5,000,000 has been turned into the Treasury from the sale of government property down here, and an additional \$4,000,000 has been received for services rendered and material supplied to individuals and companies.

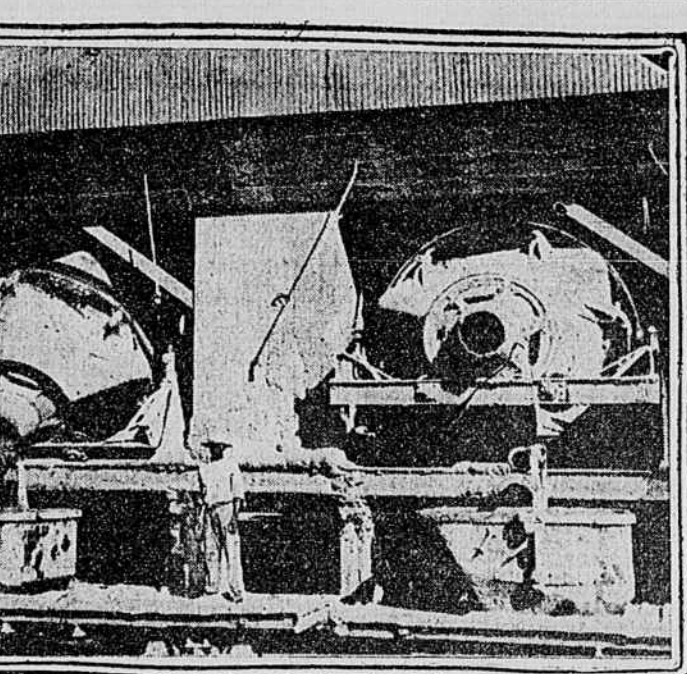
Everything is watched, and there is nothing too small to be picked up and cared for. Going through the Culebra Cut Sunday one may see a bit of iron lying on the ground, and every piece of old piping is straightened out for new work. The bad joints are thrown away, and new threads are made on that which is left. It is the same with brass, copper and old rubber. It is all saved and classified to be sold as junk. There is a car filled with rubber hose and rubber piping on the side tracks here now, and in this is a large quantity of worn rope and wire cable, and also of lead pipe, old chains and other material of various kinds.

Walking with Colonel Devol through some of these buildings covered with wire netting, I asked as to the effect of the climate upon the metal cloth. He replied:

"This woven wire lasts only about two years. It then begins to have holes, and we take it off and replace it with new. The old netting we bale up and ship to New York, where it is sold at fixed prices. We made a shipment last week which brought in \$7,000, and we have sold many lots which brought more."

It is the same with the galvanized roofing. Some of that on the French houses built twenty or thirty years ago is full of holes, but nevertheless it does for the walls of buildings where such holes do not matter. It is the same with everything. The machines are cared for as though they were race horses, and everywhere economy and efficiency march side by side.

Watching the Labor. I have already written something about the labor of the canal. Uncle Sam pays bigger wages and gives longer vacations than any other employer on earth. The men here get from 25 to 50 per cent more than in the States, and they have free quarters, free medical attendance and free fuel. They can buy eatables at a shade above cost, and each of them has six weeks' vacation, with his high rate of pay during the year. In return for this Uncle Sam sees that they do their work. There is mighty little loafing on the canal, and during working hours every muscle is put to its highest efficiency. Most of the steam shovels have been doubled, and a single shovel has excavated about 4,000 cubic yards in one day, while another has a record of hav-



Concrete mixers. Every machine is tested to see that it does its work.



Saving the lumber from Gatun Lake. This car contains one of the old houses, the site of which is now covered with water.

ing loaded more than 55,000 cubic yards in one month. That first shovel did the work of over 600 men. Now when it is remembered that we have something like 100 shovels on the isthmus, you can see how much it means that all should work well. Altogether the shovels alone represent a force equal to the labor of 10,000 or 50,000 men, and the same is true of other great machines on the isthmus, such as the track shifters and spreaders, each of which does the work of hundreds.

Machine Efficiency. Indeed, the amount of labor saved at Panama by the use of machinery is enormous. Uncle Sam is doing nothing that he can get steam, electricity or compressed air to do, and he finds that it pays. Scientific studies are made of blasting and drilling, and the men know just where to use and where to save dynamite. In connection with the steam shovels the government employs 700 or 800 men in drilling and blasting. If the work were done by hand it would have to have about 2,000 or 3,000 men, and would use about three times this amount of explosives. The track shifters and spreaders, which are handled by three white men and six laborers, can move more than a mile of track in a day, and they can spread down an eighteen-foot dump to a wide road of nine feet. It is estimated that the nine men so working are equal to a gang of 600, which would need nine foremen to handle them. The Ledges-wood unloaders, which require twenty-eight white men and forty-two laborers to operate them, each does as much work as 2,600 laborers, with the necessary white foremen, supposing the work to be done otherwise. The dredges are also of enormous saving in the way of efficiency, and we have many other machines of similar economical nature.

Uncle Sam's Bookkeeping. I wish I could show you the books that the government is keeping down here at Panama. They have a system of accounts which shows just what everything costs, down to the lifting of every pound of sand and rock, to the making of every cubic yard of concrete, and, I might say, as to the labor performance of almost every man. If the concrete in one division of the work is costing more than that of another, Uncle Sam knows it, and the books show just how much the cement and sand in each yard of that concrete cost. It is the same with the dredges and with every bit of machinery, even to the oil used in greasing the same. The cost of excavation per cubic yard is figured out to the hundredths of a cent, and the variations from month to month are estimated. This is per cubic yard of work done, and it shows just what we are getting out of the men and machines. Take, for instance, the Gatun locks.

I am looking at the records of last year. During the months of July, August and September the average cost per cubic yard of the work there was a little over \$2.36. In September it was about \$2, in August almost \$5, and in July only a little over \$2.

This was made up of items like the following: Cost of drilling, 20 cents; blasting, 23 cents; loading by power, 5 cents; by hand, 7 cents; track transportation, 23 cents; tracks, 1 cent; division expenses, 13 cents, and so on, making up the total that I have given.

I would say, however, that I have only quoted the round numbers, and that each of these calculations is carried out to the hundredths of a cent.

Where Sixteen Cents Goes.

When you divide a cent into a hundred parts and make your calculations on a job of \$100,000,000 you are getting things down to a pretty fine point. But this is done as to everything. In each cubic yard on the Atlantic, where the dredging costs 16 cents, they know to the fraction of a cent just what the cost of the use of the pipe lines is. They know the cost of the repairs, the cost of the operation of the dredges, the cost of the breakers, the cost of the big boats and the little boats, and of everything that can possibly enter into that work.

On that division there are fourteen different items which form a part of the unit cost of getting one cubic yard of earth out of the sea and landing it, and the total cost is only a little over 15 cents. In addition to this is the administration and general expense account, which is a little more than a cent, and which must be added. In getting out stone from the quarries, the stripping, drilling, blasting, the mixing and other things, similar work is going on in different places all over the Canal Zone, and if one part of the work goes much ahead or behind the others, the cost that must be investigated and the reason is known.

How Uncle Sam Buys.

There has not been some scandal connected with the canal purchases. They cannot be. \$400,000,000 can pass through the itching palms of a hundred thousands of weak, avaricious human beings without a large percentage sticking thereto. Indeed, it would be risky were it not for the safeguards. Uncle Sam has his purchases well watched, and there is an army of detectives always on the outlook for frauds. One great protection is the method by which purchases are made. This provides for every contract for work or materials to the amount of \$1,000 or over can be awarded only after bids for the same have been advertised for and then only to the lowest bidder. The bids are made upon plans and specifications and upon accurate descriptions as to the machinery and material of which the goods are composed. Every bidder has to send in a bond with his bid or a certain check of not less than 15 per cent of its amount for his faithful carrying out of the same. If it should be accepted, and if he backs out he loses this money, and if he starts and fails to complete the work he is liable for damages.

Bidding of this kind is done as to small contracts as well as to large ones. I have before me the circular which gives the proposals for the great lock gates, which it will be remembered were awarded to Pittsburgh parties at a cost of over \$5,000,000. It fills many pages and it is accompanied by designs which show just what the locks must be. The provisions state how the steel must be made, how tested, what the constituent elements of each part must be and also an infinite number of details and provisions that a full page of this newspaper would not contain them all.

After such contracts are made the government sends its scientists and engineers to see that the work is done, and the details of the contract are carried out. These men make chemical and other tests from time to time. They assay the metals which go into the various parts and measure to the thousandth part of an inch every piece of machinery. The loss of a single may destroy a contract and the result is that Uncle Sam usually gets what he orders, although the contractor may go bankrupt in furnishing the work. (Copyright, 1912, by Frank G. Carpenter.)

A Genuine Hair Restorer

Did you ever know of any hair preparation which would really grow hair and restore the color to gray or faded hair?

There are many preparations highly advertised to do the work, but it is probably your experience that none of them will really meet the claims of their manufacturers.

There are many so-called Hair Restorers which are nothing more than harmful chemical dyes, which do not grow any hair, the only result being that they dyed the hair, having no permanency and often causing a streaky appearance.

It has been the aim of the chemists for years to discover a preparation which would really grow hair and restore the color to gray or faded hair, but heretofore they have met with no success.

Prof. Rembler now claims to have discovered a combination of harmless vegetable composition which is a Genuine Hair Restorer and will grow hair and does not contain any dye of any kind, but will positively restore the natural color and brilliancy to gray and faded hair.

This is a very strong statement to make, and if any chemist without the recognized ability and national reputation of Prof. Rembler were to make this claim we would be inclined to be skeptical as to its truth. It will be remembered by readers that are familiar with scientific discoveries that Prof. Rembler was the inventor of the one fire process for gilding glass, and also the Rembler Wireless Coherer. Any statement made by Prof. Rembler is entitled to consideration, as he would not make any statements which were not true and would injure his established reputation.

The Siloron Mfg. Co., of Pueblo, Colo., have purchased the exclusive American rights to manufacture Sagine, as they have named Prof. Rembler's invention, after having made a six months' test of Sagine and thoroughly demonstrating that it would positively do the work. The Siloron Mfg. Co. have authorized us to make the following remarkable offer to all who need a "Genuine Hair Restorer."

They will send a written agreement with every bottle of Sagine, to the effect that if one bottle of Sagine conscientiously used according to the directions does not give entire satisfaction to the purchaser, if Sagine does not actually grow hair and restore the color to gray or faded hair, remove dandruff and make the hair healthy and glossy, they will pay the sum of \$5 to any dissatisfied purchaser.

This is the strongest offer ever made by any manufacturer, and one they could not possibly make if they did not know positively from experiment that it would do exactly what they claim for it. No one takes any chance in buying Sagine, as it is certainly worth \$1 to use a Genuine Hair Restorer that will really grow hair, and if it does not give satisfaction they will pay you the \$5 as agreed. Send a \$1 bill to The Siloron Mfg. Co., Pueblo, Colo., stating that you wish to purchase a bottle of Sagine with the written agreement to grow hair and restore the color to gray or faded hair or pay you the sum of \$5, and it will be sent to you by express in plain wrapper.

The Siloron Mfg. Co. is incorporated under the laws of the State of Colorado, and refer you to the mercantile agencies or any Pueblo banks as to their ability to fulfill any agreement they make.

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